BY
CRAFTSMAN

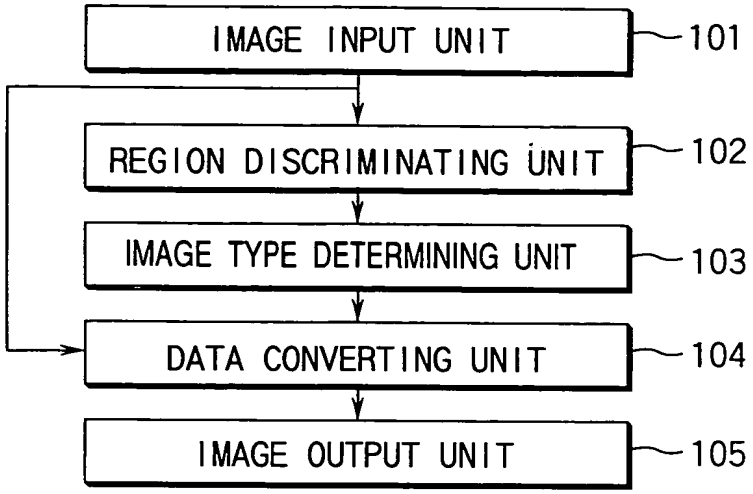

FIG. 1

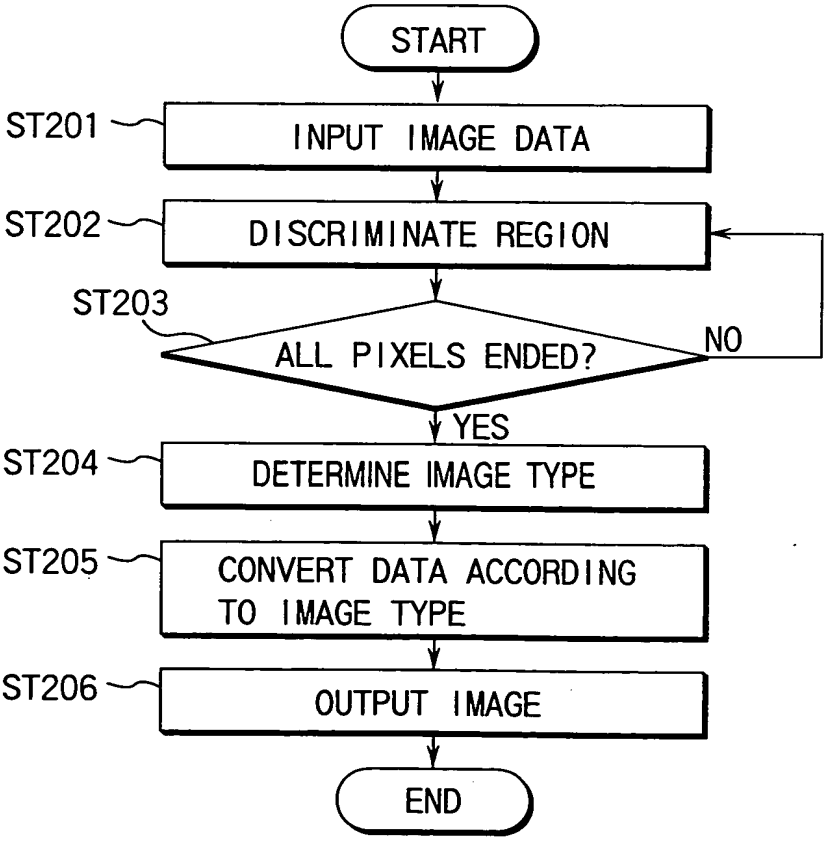

FIG. 2

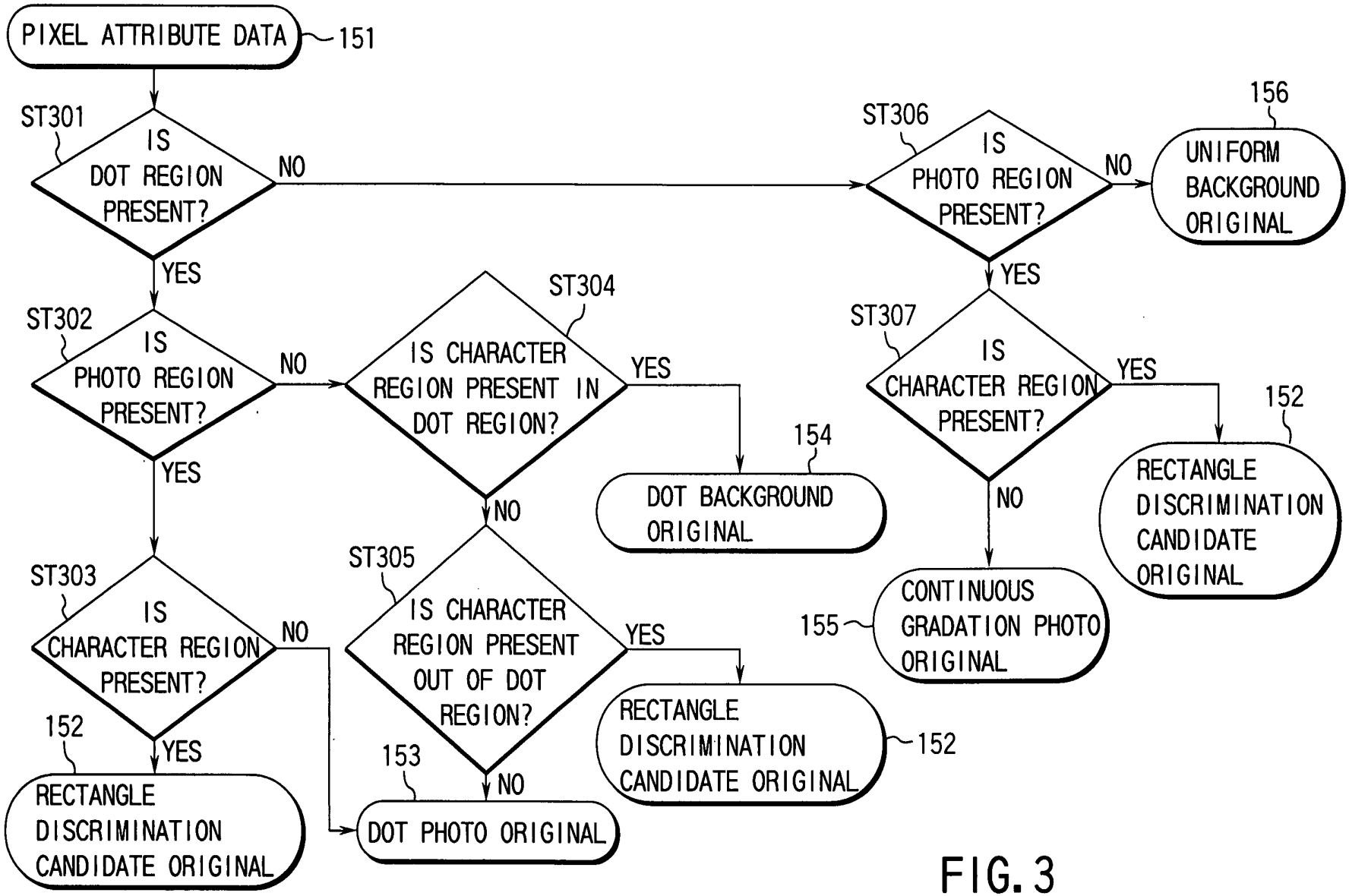
PIXEL ATTRIBUTE DATA
151
ST301
IS DOT REGION PRESENT?
NO
YES
ST302
IS PHOTO REGION PRESENT?
NO
YES
ST303
IS CHARACTER REGION PRESENT?
NO
YES
152
RECTANGLE DISCRIMINATION CANDIDATE ORIGINAL
ST304
IS CHARACTER REGION PRESENT IN DOT REGION?
YES
154
DOT BACKGROUND ORIGINAL
NO
ST305
IS CHARACTER REGION PRESENT OUT OF DOT REGION?
YES
152
RECTANGLE DISCRIMINATION CANDIDATE ORIGINAL
NO
153
DOT PHOTO ORIGINAL
ST306
IS PHOTO REGION PRESENT?
NO
156
UNIFORM BACKGROUND ORIGINAL
YES
ST307
IS CHARACTER REGION PRESENT?
YES
152
RECTANGLE DISCRIMINATION CANDIDATE ORIGINAL
NO
155
CONTINUOUS GRADATION PHOTO ORIGINAL

FIG. 3

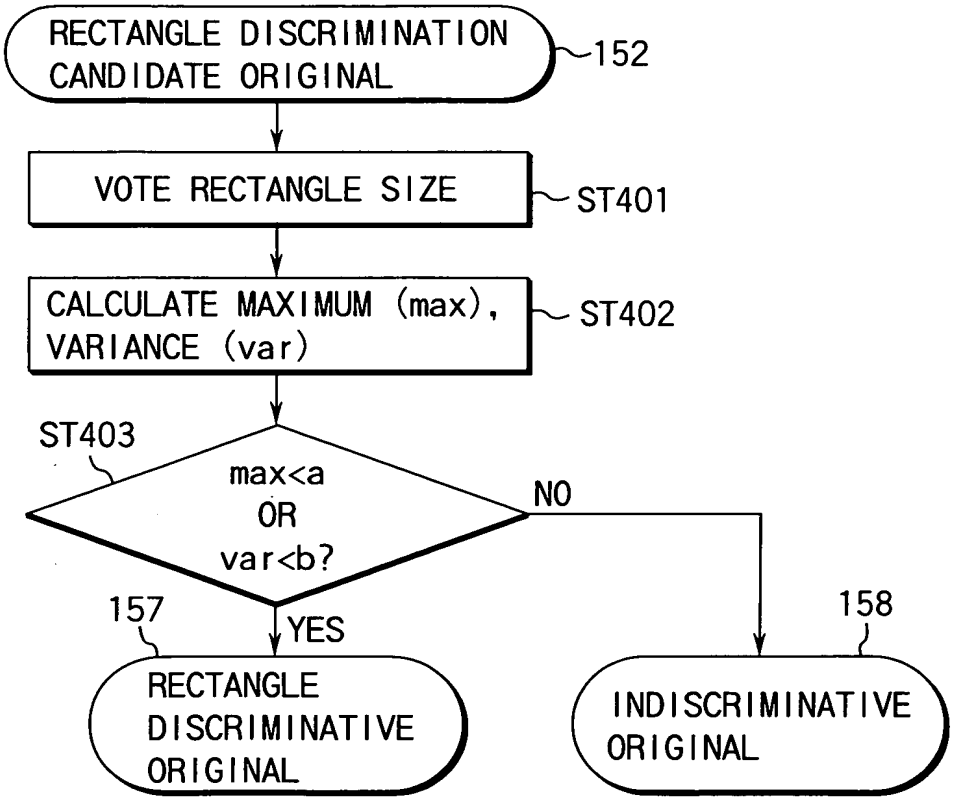
RECTANGLE DISCRIMINATION CANDIDATE ORIGINAL
152
VOTE RECTANGLE SIZE
ST401
CALCULATE MAXIMUM (max), VARIANCE (var)
ST402
ST403
max<a OR var<b?
NO
YES
157
158
RECTANGLE DISCRIMINATIVE ORIGINAL
INDISCRIMINATIVE ORIGINAL

FIG. 4

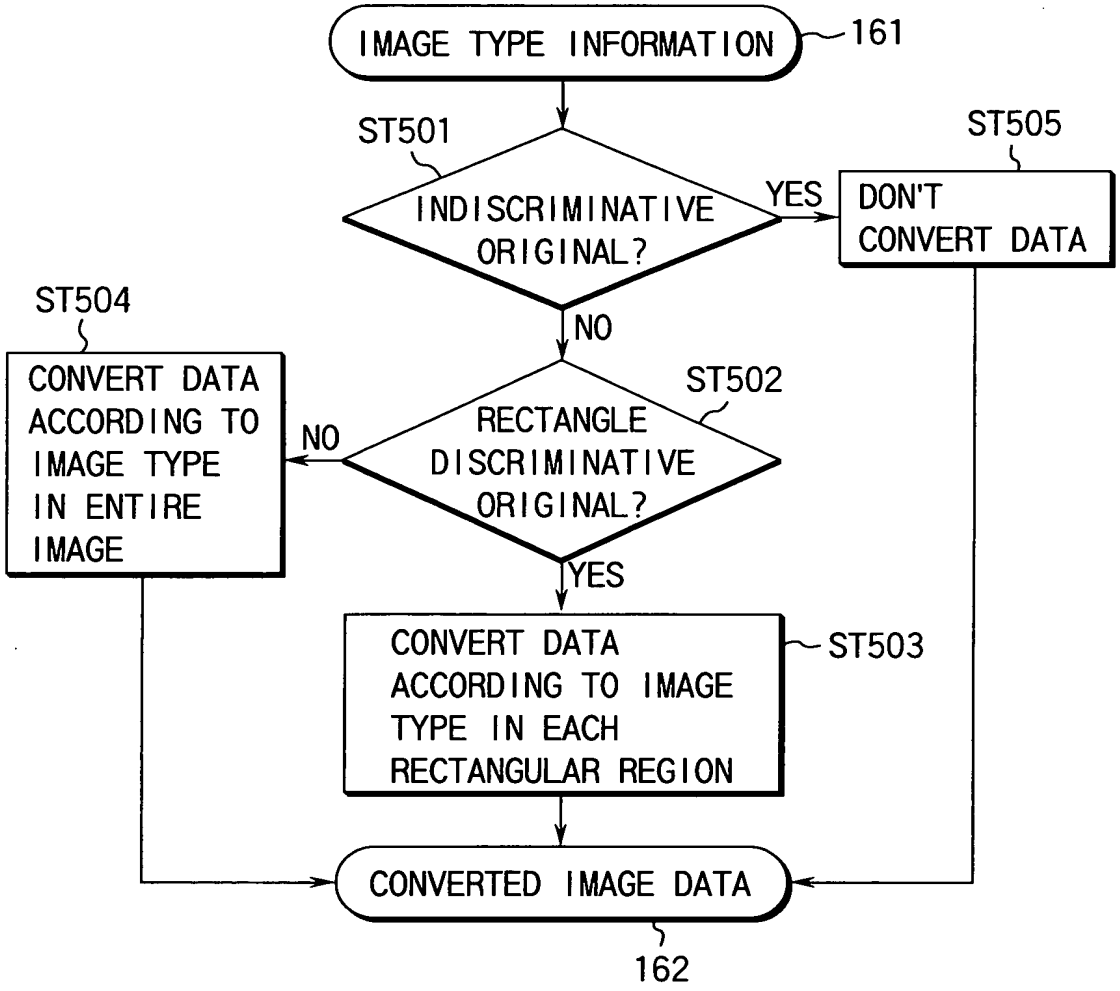
IMAGE TYPE INFORMATION
161
ST501
INDISCRIMINATIVE ORIGINAL?
YES
ST505
DON'T CONVERT DATA
NO
ST504
CONVERT DATA ACCORDING TO IMAGE TYPE IN ENTIRE IMAGE
NO
ST502
RECTANGLE DISCRIMINATIVE ORIGINAL?
YES
CONVERT DATA ACCORDING TO IMAGE TYPE IN EACH RECTANGULAR REGION
ST503
CONVERTED IMAGE DATA
162

FIG. 5

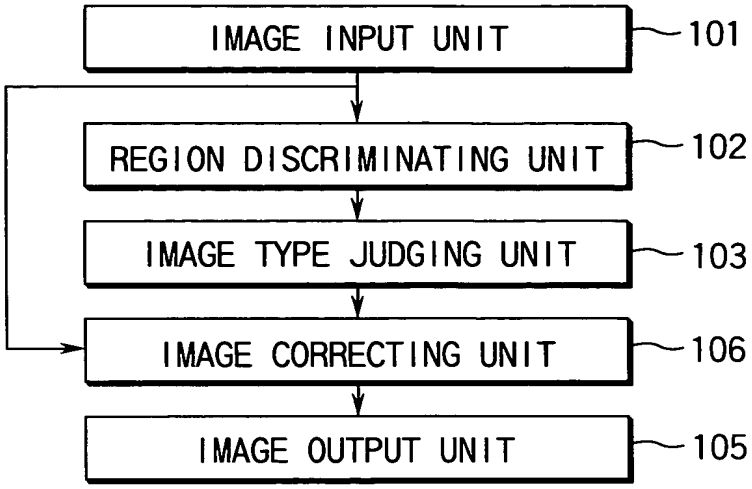
IMAGE INPUT UNIT
101
REGION DISCRIMINATING UNIT
102
IMAGE TYPE JUDGING UNIT
103
IMAGE CORRECTING UNIT
106
IMAGE OUTPUT UNIT
105

FIG. 6

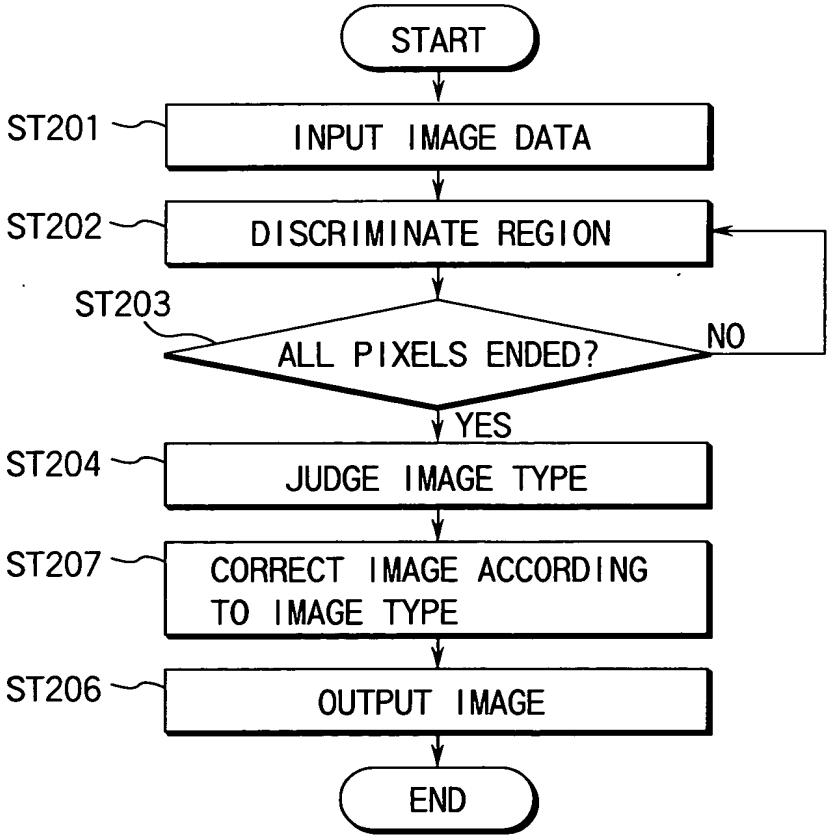
START
ST201
INPUT IMAGE DATA
ST202
DISCRIMINATE REGION
ST203
ALL PIXELS ENDED?
NO
YES
ST204
JUDGE IMAGE TYPE
ST207
CORRECT IMAGE ACCORDING TO IMAGE TYPE
ST206
OUTPUT IMAGE
END

FIG. 7

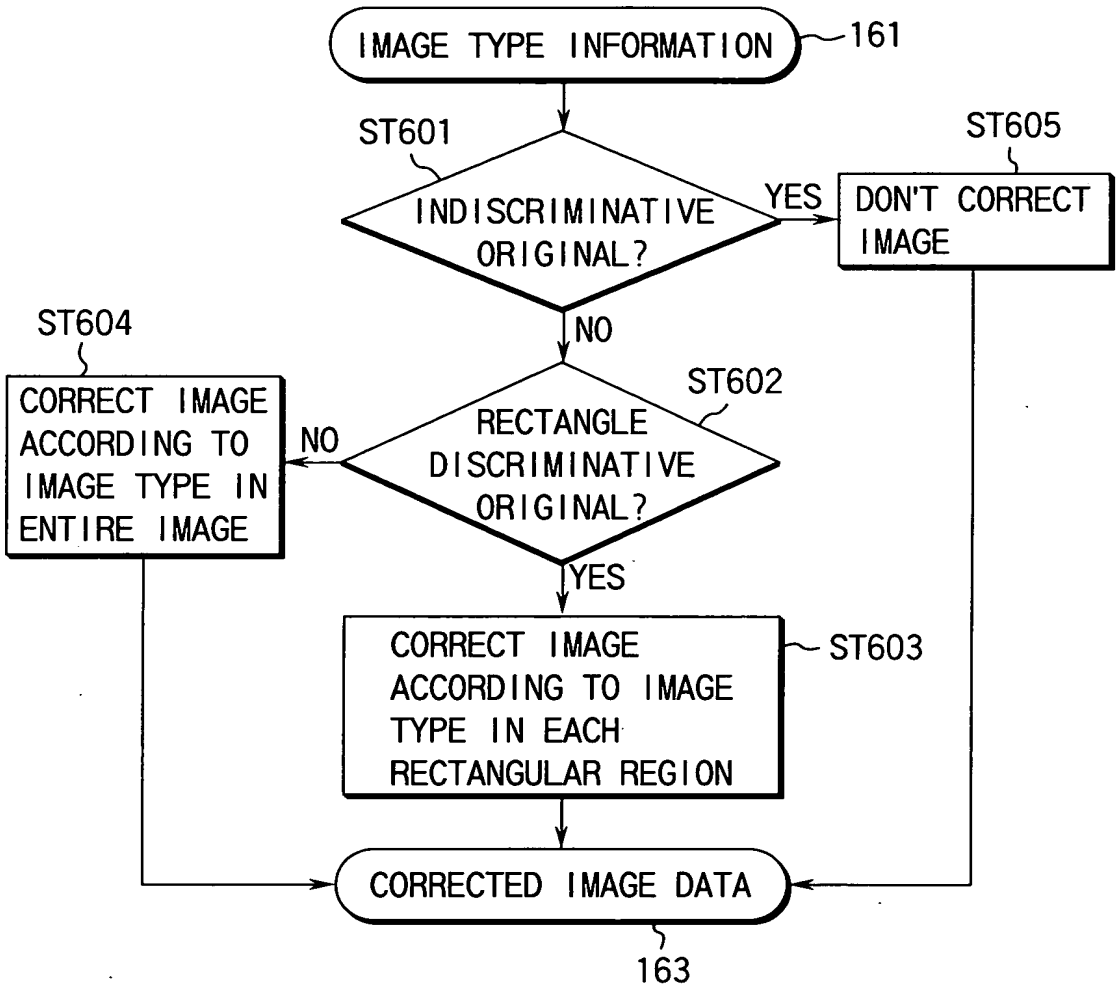
IMAGE TYPE INFORMATION
161
ST601
INDISCRIMINATIVE ORIGINAL?
YES
ST605
DON'T CORRECT IMAGE
NO
ST602
RECTANGLE DISCRIMINATIVE ORIGINAL?
NO
ST604
CORRECT IMAGE ACCORDING TO IMAGE TYPE IN ENTIRE IMAGE
YES
CORRECT IMAGE ACCORDING TO IMAGE TYPE IN EACH RECTANGULAR REGION
ST603
CORRECTED IMAGE DATA
163

FIG. 8

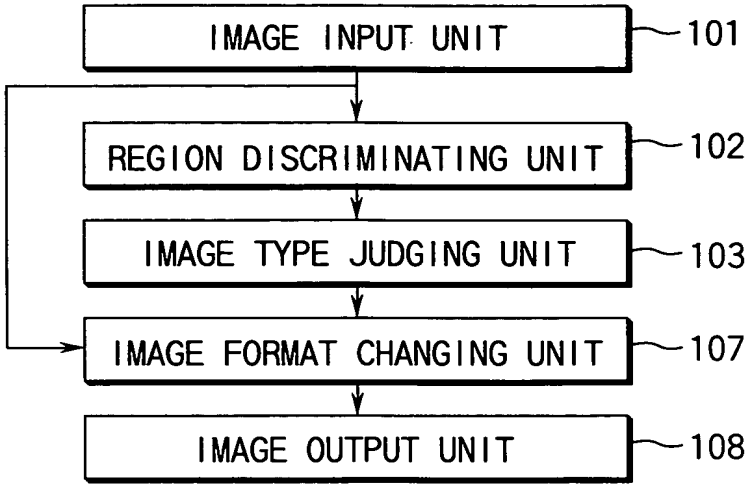
IMAGE INPUT UNIT
101
REGION DISCRIMINATING UNIT
102
IMAGE TYPE JUDGING UNIT
103
IMAGE FORMAT CHANGING UNIT
107
IMAGE OUTPUT UNIT
108

FIG. 9

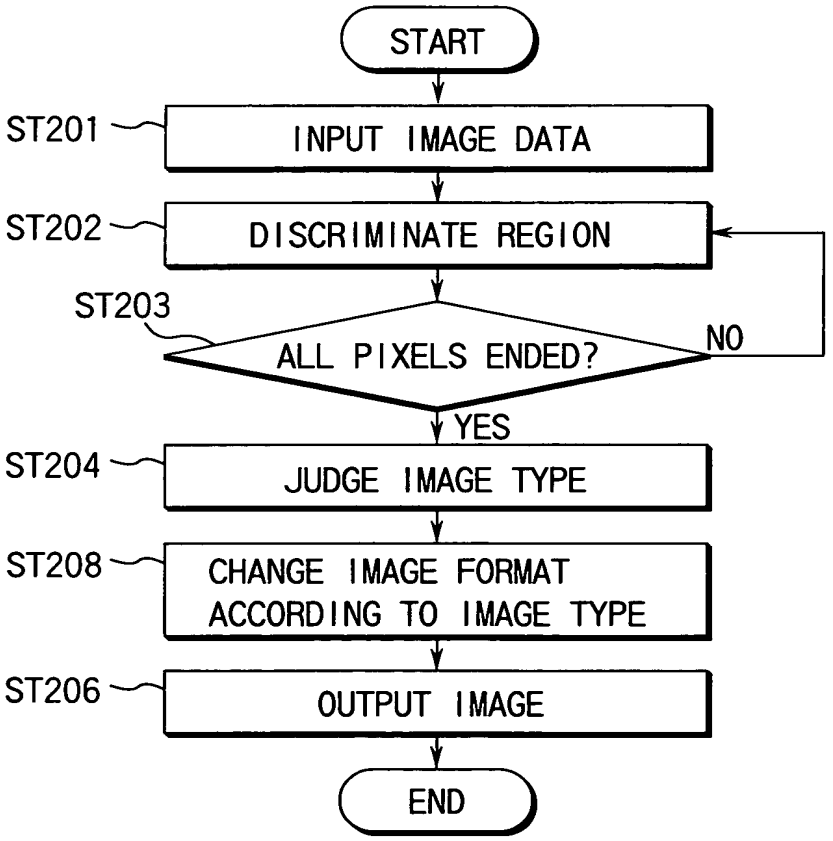
START
ST201
INPUT IMAGE DATA
ST202
DISCRIMINATE REGION
ST203
ALL PIXELS ENDED?
NO
YES
ST204
JUDGE IMAGE TYPE
ST208
CHANGE IMAGE FORMAT
ACCORDING TO IMAGE TYPE
ST206
OUTPUT IMAGE
END

FIG. 10

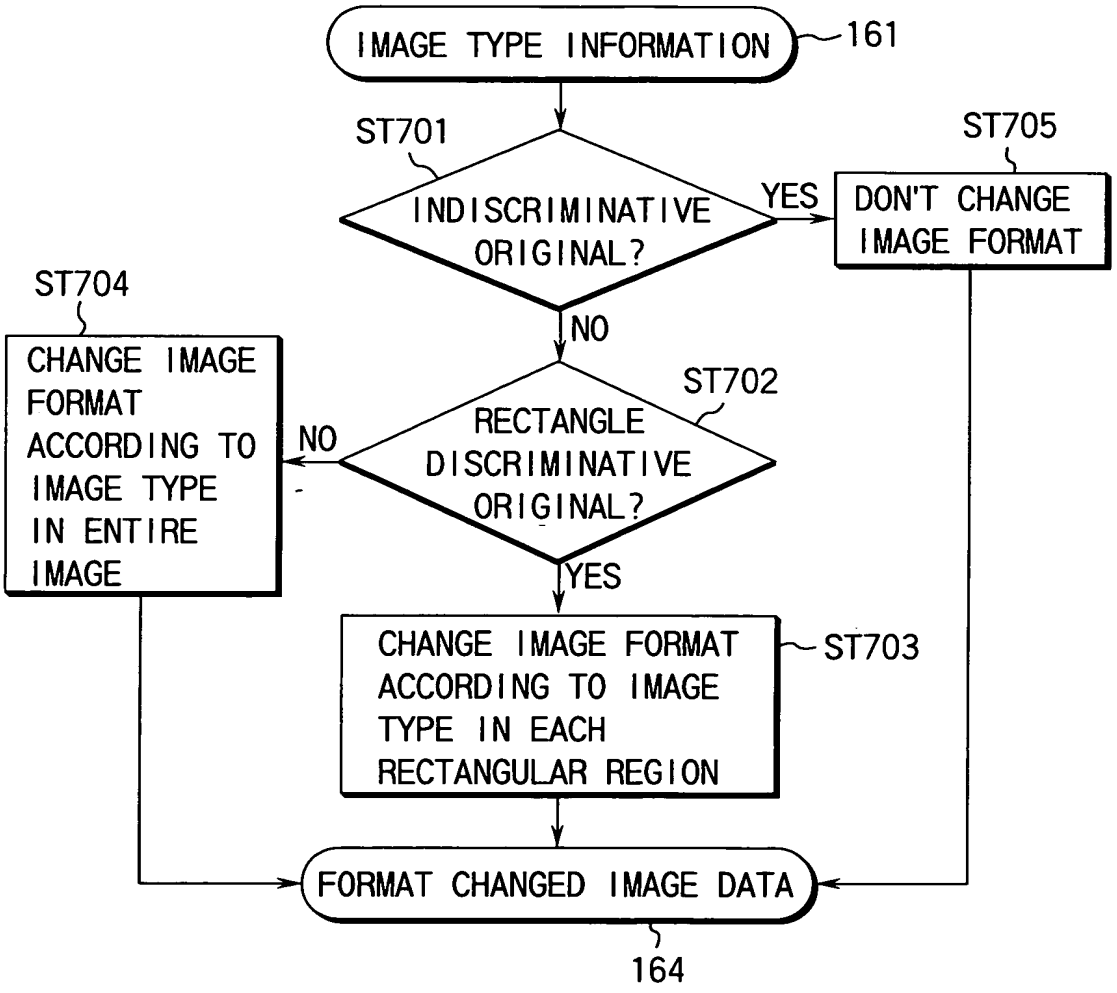
IMAGE TYPE INFORMATION
161
ST701
INDISCRIMINATIVE ORIGINAL?
YES
ST705
DON'T CHANGE IMAGE FORMAT
NO
ST704
CHANGE IMAGE FORMAT ACCORDING TO IMAGE TYPE IN ENTIRE IMAGE
NO
ST702
RECTANGLE DISCRIMINATIVE ORIGINAL?
YES
CHANGE IMAGE FORMAT ACCORDING TO IMAGE TYPE IN EACH RECTANGULAR REGION
ST703
FORMAT CHANGED IMAGE DATA
164

FIG. 11

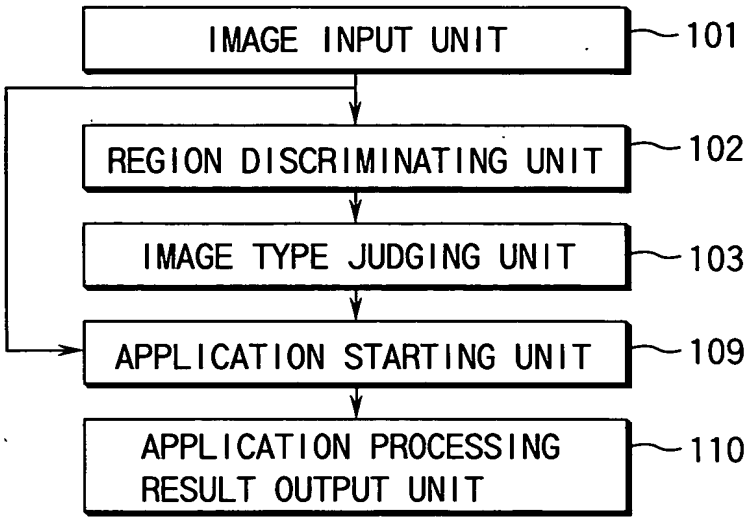
IMAGE INPUT UNIT
101
REGION DISCRIMINATING UNIT
102
IMAGE TYPE JUDGING UNIT
103
APPLICATION STARTING UNIT
109
APPLICATION PROCESSING RESULT OUTPUT UNIT
110

FIG. 12

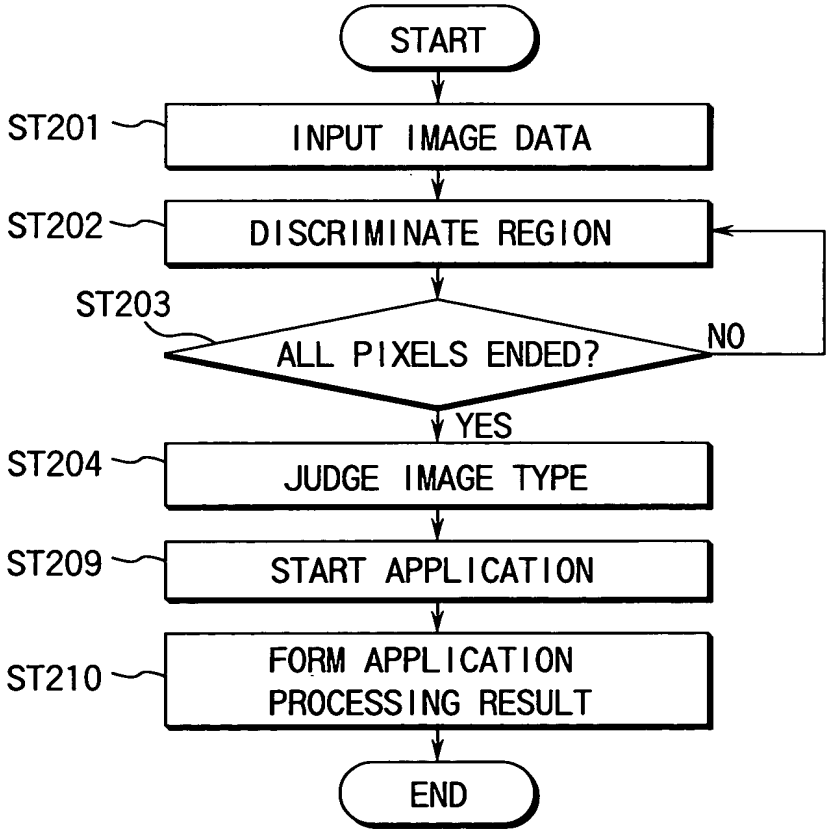
START
ST201
INPUT IMAGE DATA
ST202
DISCRIMINATE REGION
ST203
ALL PIXELS ENDED?
NO
YES
ST204
JUDGE IMAGE TYPE
ST209
START APPLICATION
ST210
FORM APPLICATION PROCESSING RESULT
END

FIG. 13

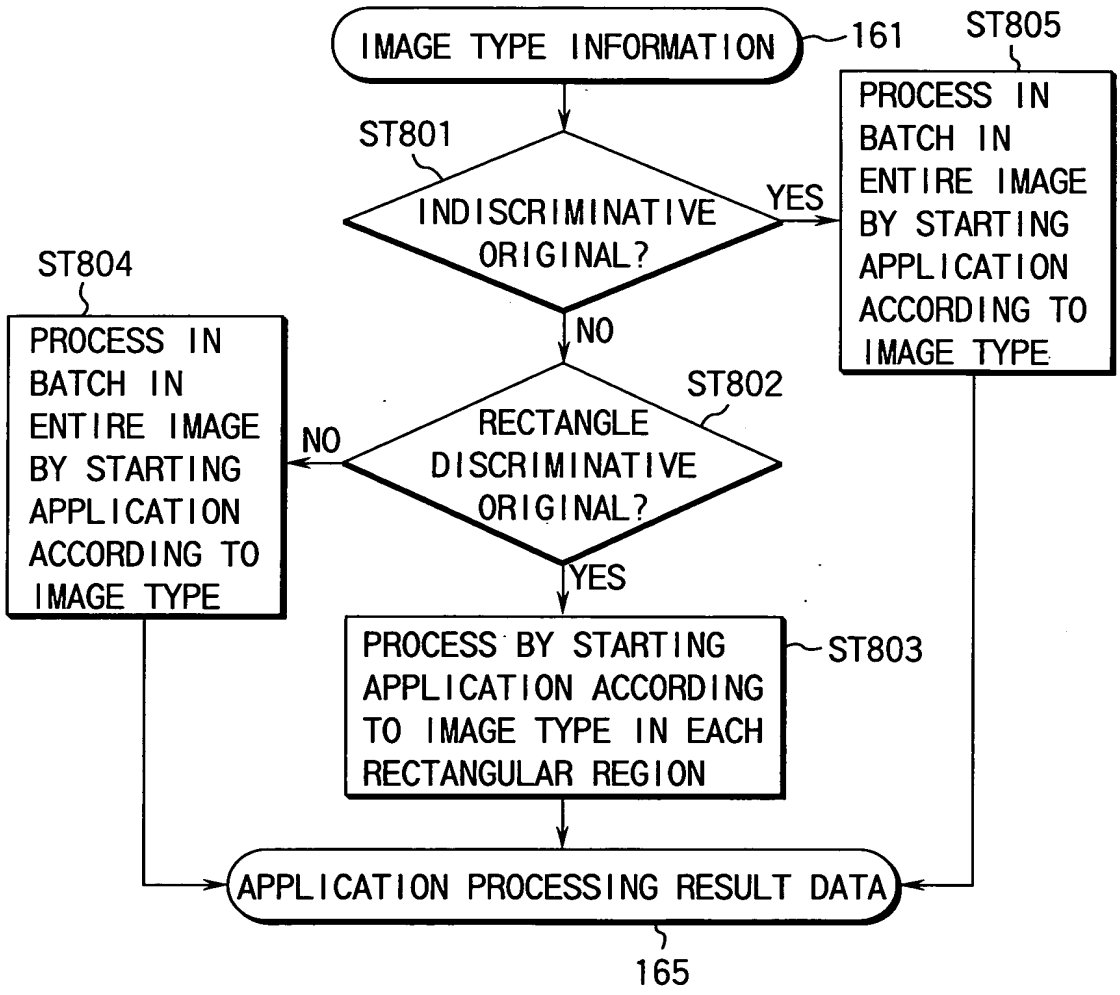
IMAGE TYPE INFORMATION
161
ST805
PROCESS IN BATCH IN ENTIRE IMAGE BY STARTING APPLICATION ACCORDING TO IMAGE TYPE
ST801
INDISCRIMINATIVE ORIGINAL?
YES
NO
ST804
PROCESS IN BATCH IN ENTIRE IMAGE BY STARTING APPLICATION ACCORDING TO IMAGE TYPE
ST802
RECTANGLE DISCRIMINATIVE ORIGINAL?
NO
YES
PROCESS BY STARTING APPLICATION ACCORDING TO IMAGE TYPE IN EACH RECTANGULAR REGION
ST803
APPLICATION PROCESSING RESULT DATA
165

FIG. 14

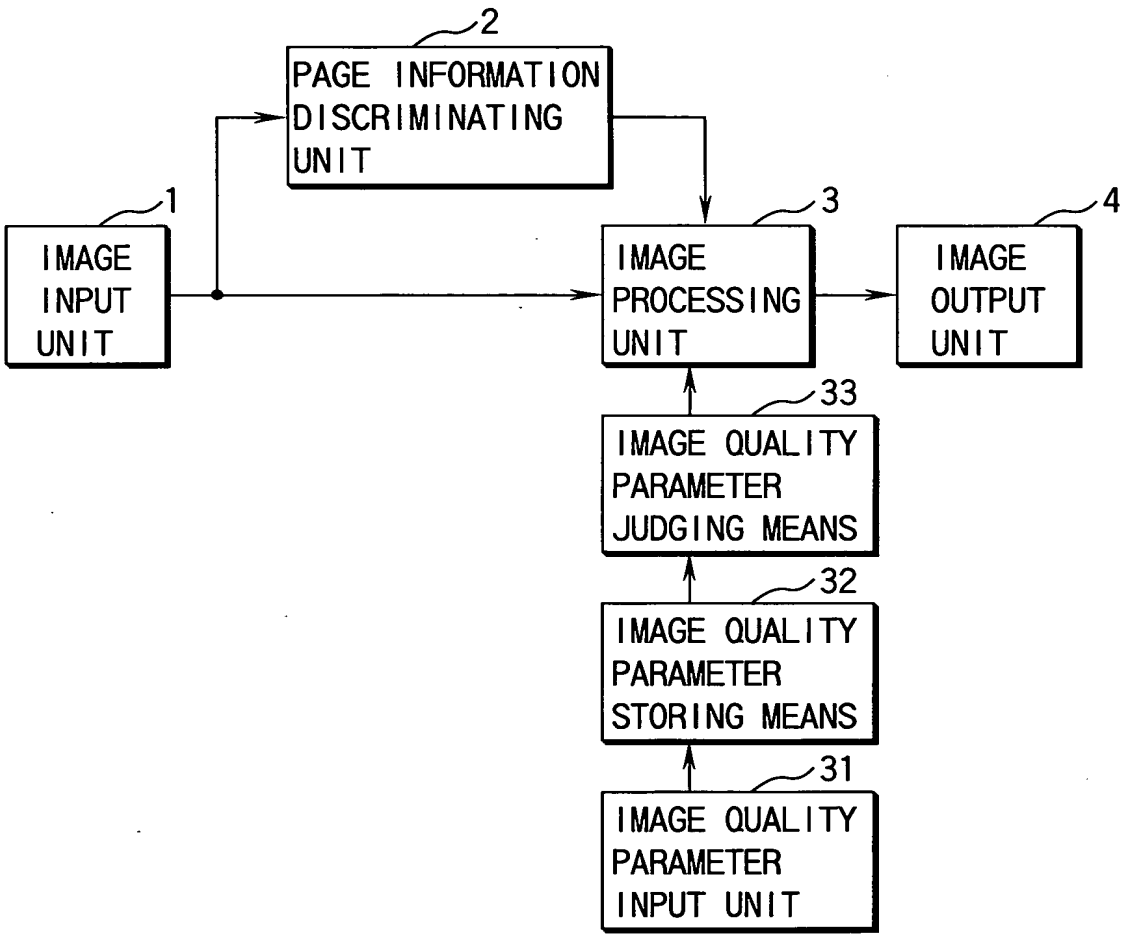
2
PAGE INFORMATION DISCRIMINATING UNIT
1
IMAGE INPUT UNIT
3
IMAGE PROCESSING UNIT
4
IMAGE OUTPUT UNIT
33
IMAGE QUALITY PARAMETER JUDGING MEANS
32
IMAGE QUALITY PARAMETER STORING MEANS
31
IMAGE QUALITY PARAMETER INPUT UNIT

FIG. 15

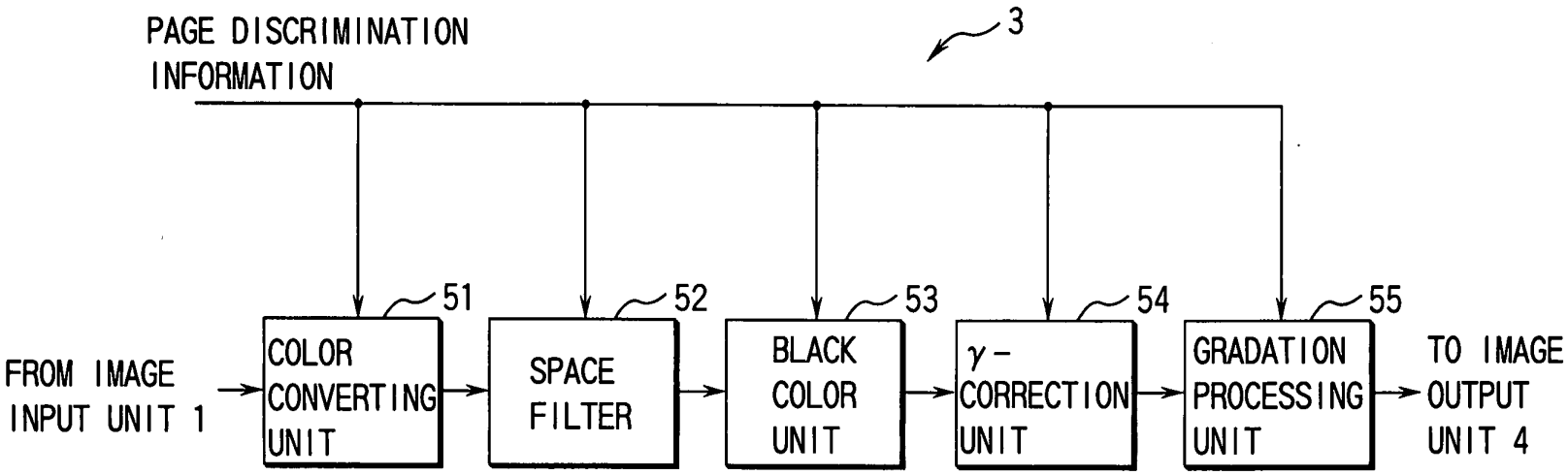
PAGE DISCRIMINATION INFORMATION
3
51
52
53
54
55
FROM IMAGE INPUT UNIT 1
COLOR CONVERTING UNIT
SPACE FILTER
BLACK COLOR UNIT
γ - CORRECTION UNIT
GRADATION PROCESSING UNIT
TO IMAGE OUTPUT UNIT 4

FIG. 16

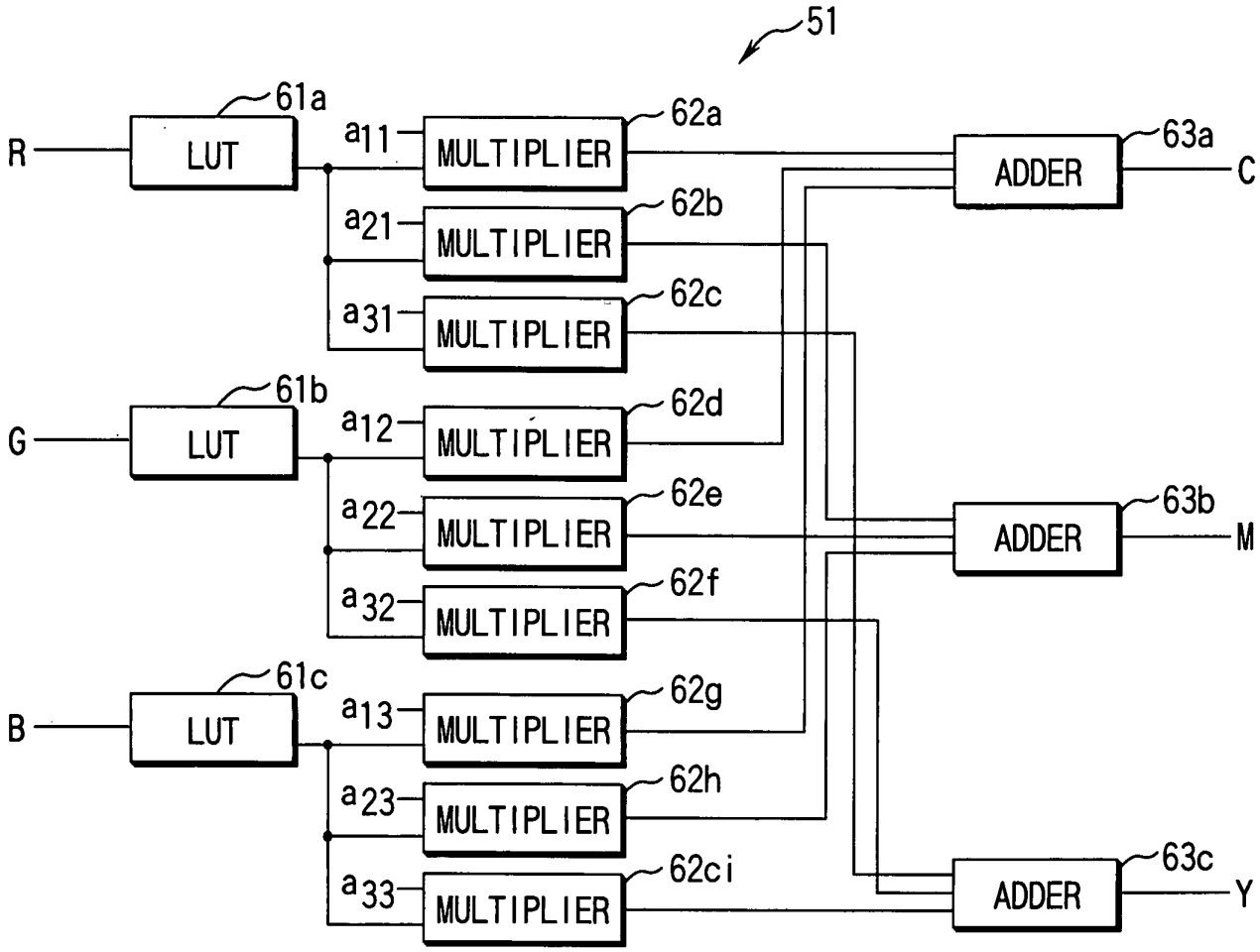
51
61a
R
LUT
a11
MULTIPLIER
62a
a21
MULTIPLIER
62b
a31
MULTIPLIER
62c
61b
G
LUT
a12
MULTIPLIER
62d
a22
MULTIPLIER
62e
a32
MULTIPLIER
62f
61c
B
LUT
a13
MULTIPLIER
62g
a23
MULTIPLIER
62h
a33
MULTIPLIER
62ci
ADDER
63a
C
ADDER
63b
M
ADDER
63c
Y

FIG. 17

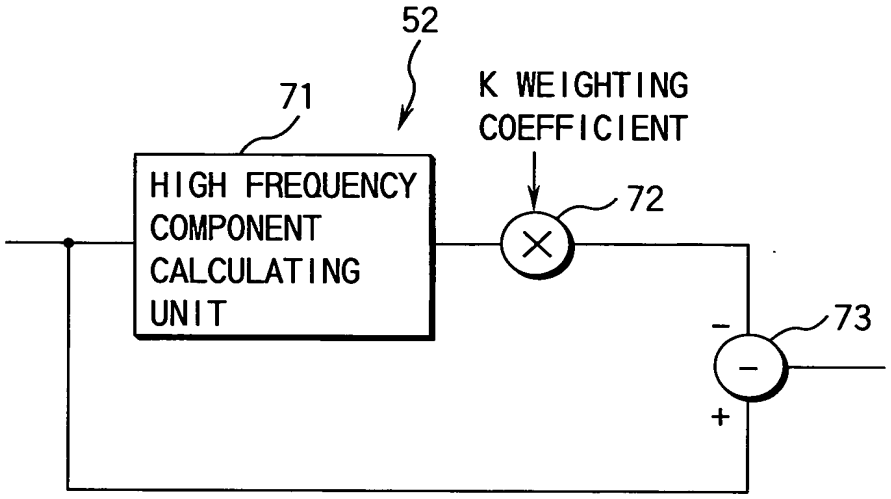

FIG. 18

0	1	0
1	-4	1
0	1	0

FIG. 19

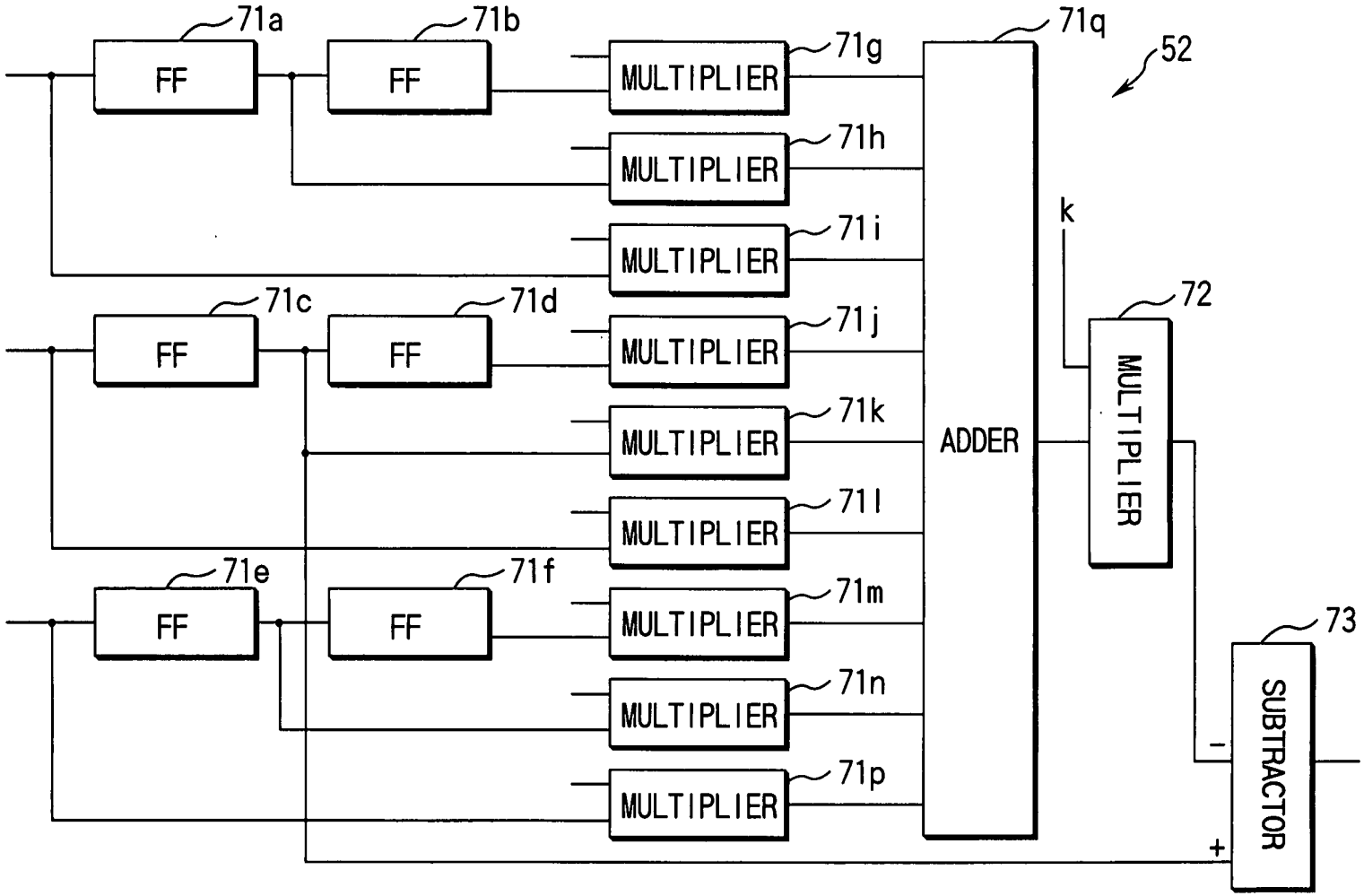
71a
71b
FF
FF
MULTIPLIER
71g
71h
71i
71c
71d
71j
71k
71l
71e
71f
71m
71n
71p
71q
52
ADDER
k
72
MULTIPLIER
73
SUBTRACTOR
-
+

FIG. 20

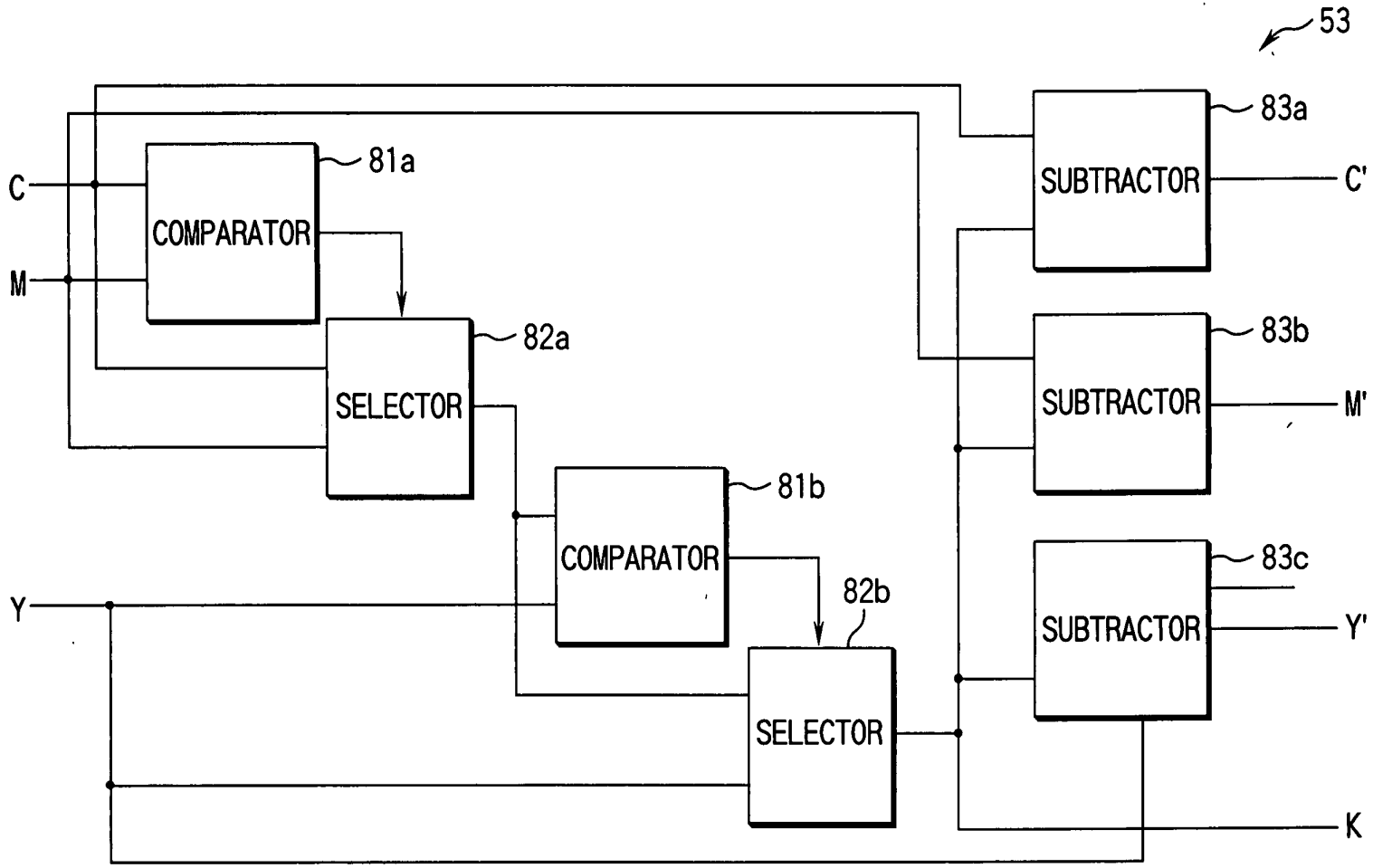
53
C
M
Y
81a
COMPARATOR
82a
SELECTOR
81b
COMPARATOR
82b
SELECTOR
83a
SUBTRACTOR
C'
83b
SUBTRACTOR
M'
83c
SUBTRACTOR
Y'
K

FIG. 21

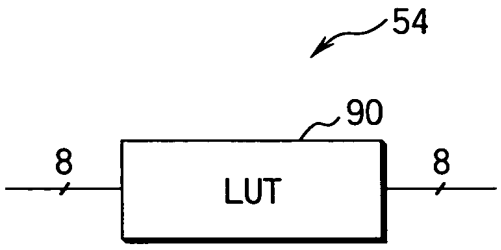

FIG. 22

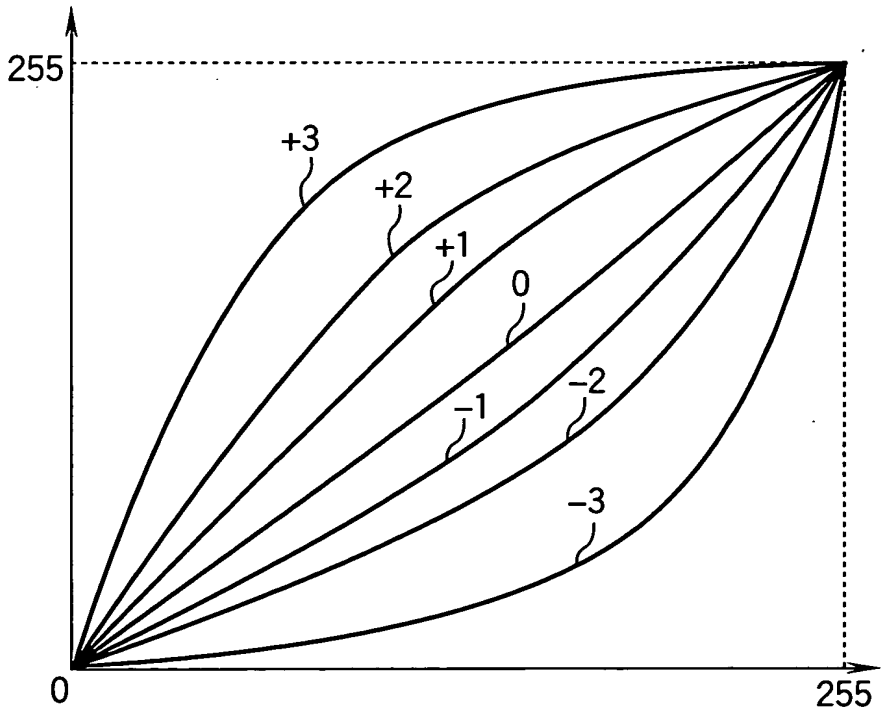

FIG. 23

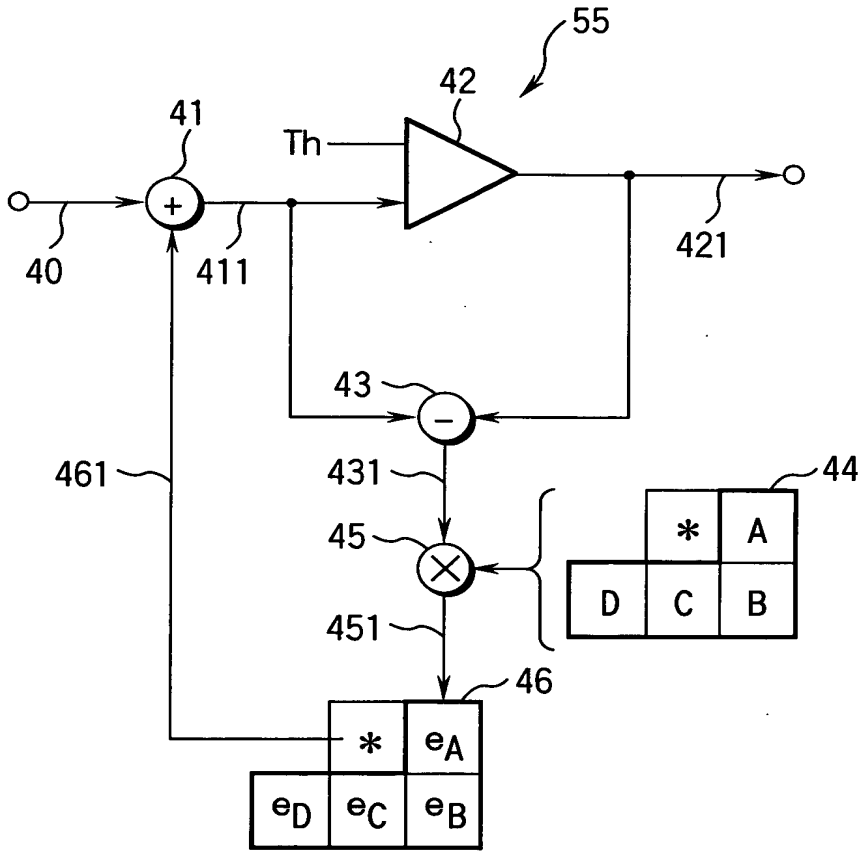

FIG. 24

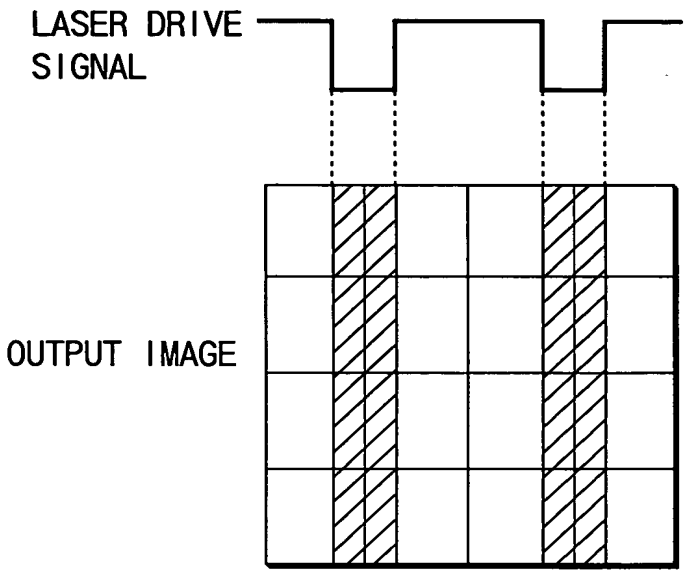

FIG. 25A

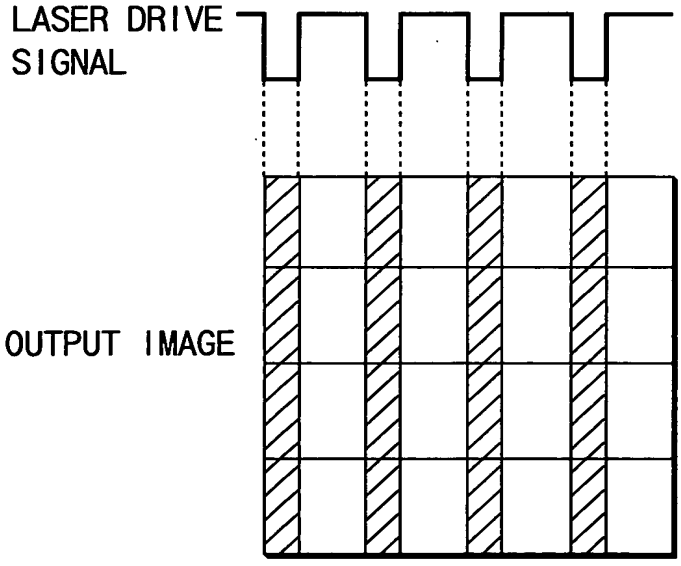

FIG. 25B

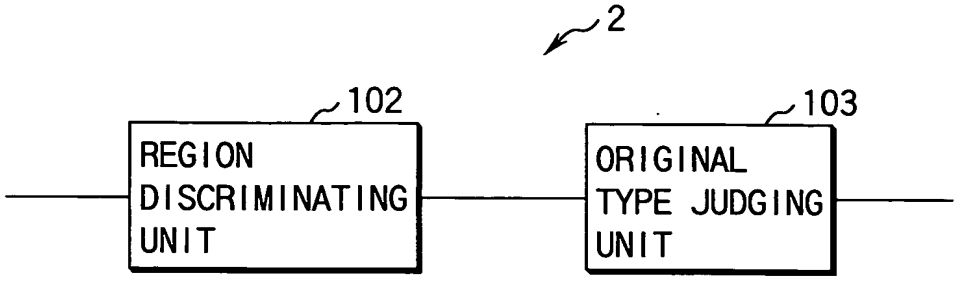
2
102
REGION DISCRIMINATING UNIT
103
ORIGINAL TYPE JUDGING UNIT

FIG. 26

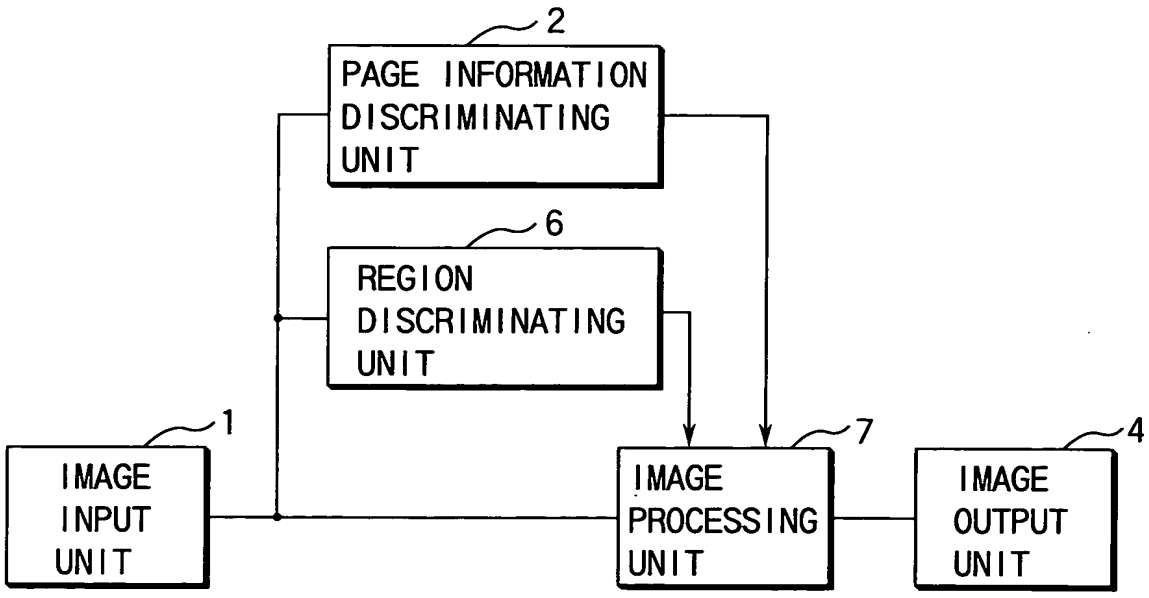
2
PAGE INFORMATION DISCRIMINATING UNIT
6
REGION DISCRIMINATING UNIT
1
IMAGE INPUT UNIT
7
IMAGE PROCESSING UNIT
4
IMAGE OUTPUT UNIT

FIG. 27

PAGE DISCRIMINATION INFORMATION
0. REGION DISCRIMINATION
1. UNIFORM BACKGROUND
2. DOT BACKGROUND
3. DOT PHOTO
4. CONTINUOUS PHOTO
5. INDISCRIMINATIVE
6. TIME OVER

FIG. 28A

ORIGINAL MODE
0. CHARACTER/PHOTO
1. CHARACTER
2. MAP
3. PRINTED PHOTO
4. PHOTOGRAPHIC PRINTING PAPER PHOTO

FIG. 28B

ORIGINAL MODE
AUTOMATIC MODE
CHARACTER/PHOTO MODE
CHARACTER MODE
MAP MODE
PRINTED PHOTO MODE
PHOTOGRAPHIC PRINTING PAPER PHOTO MODE

FIG. 28C

PAGE DISCRIMINATION INFORMATION
0. UNIFORM BACKGROUND
1. DOT BACKGROUND
2. DOT PHOTO
3. CONTINUOUS PHOTO

FIG. 28D

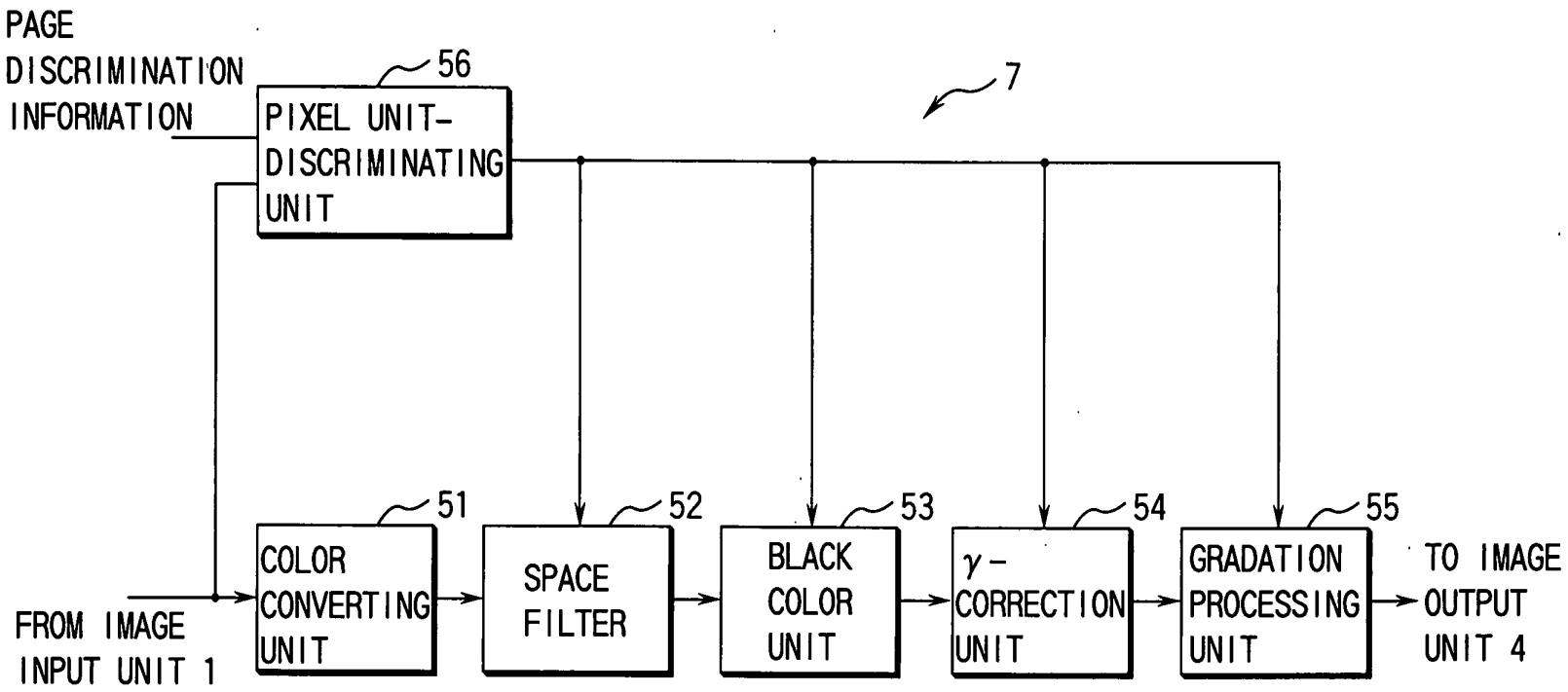
PAGE
DISCRIMINATION
INFORMATION
56
PIXEL UNIT-
DISCRIMINATING
UNIT
7
51
COLOR
CONVERTING
UNIT
52
SPACE
FILTER
53
BLACK
COLOR
UNIT
54
γ-
CORRECTION
UNIT
55
GRADATION
PROCESSING
UNIT
FROM IMAGE
INPUT UNIT 1
TO IMAGE
OUTPUT
UNIT 4

FIG. 29

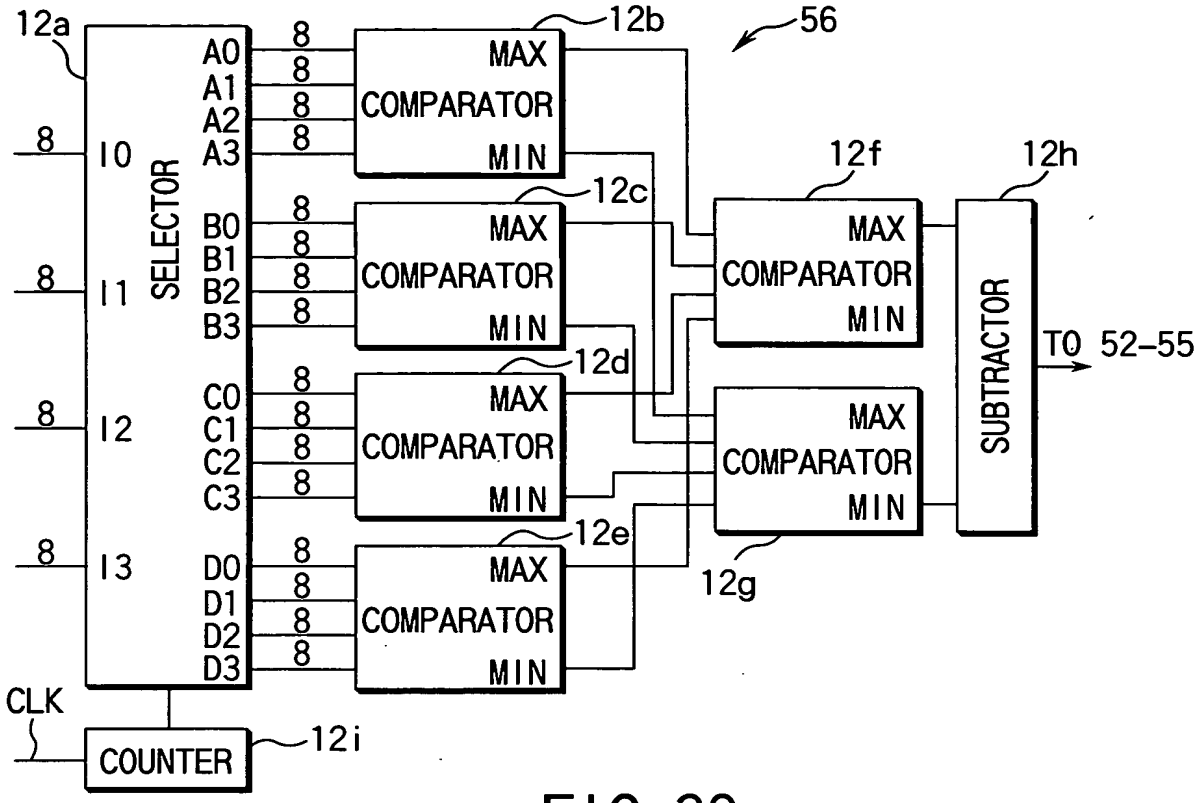
12a
56
12b
12c
12d
12e
12f
12g
12h
12i
SELECTOR
I0
I1
I2
I3
A0
A1
A2
A3
B0
B1
B2
B3
C0
C1
C2
C3
D0
D1
D2
D3
8
MAX
COMPARATOR
MIN
SUBTRACTOR
T0 52–55
CLK
COUNTER

FIG. 30

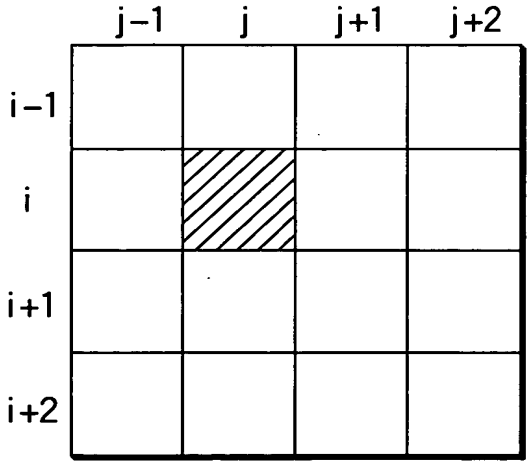
j–1
j
j+1
j+2
i–1
i
i+1
i+2

FIG. 31

DOCID: <1756360

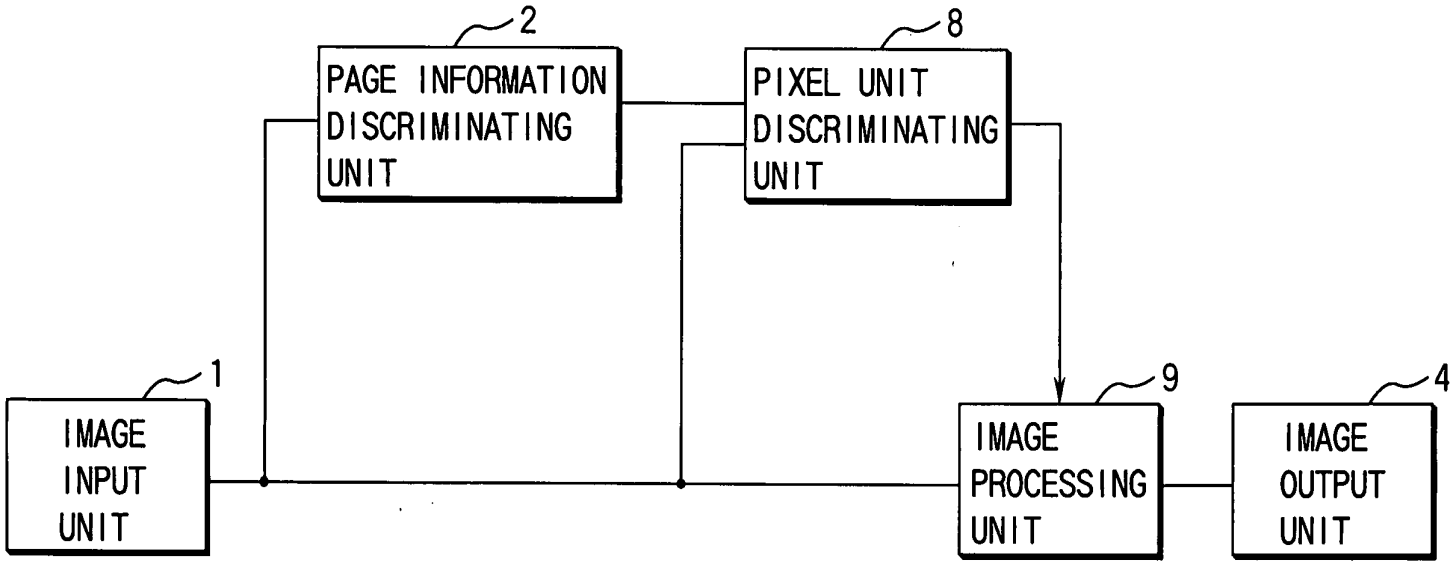

FIG. 32

POSTED: 4/16/2010

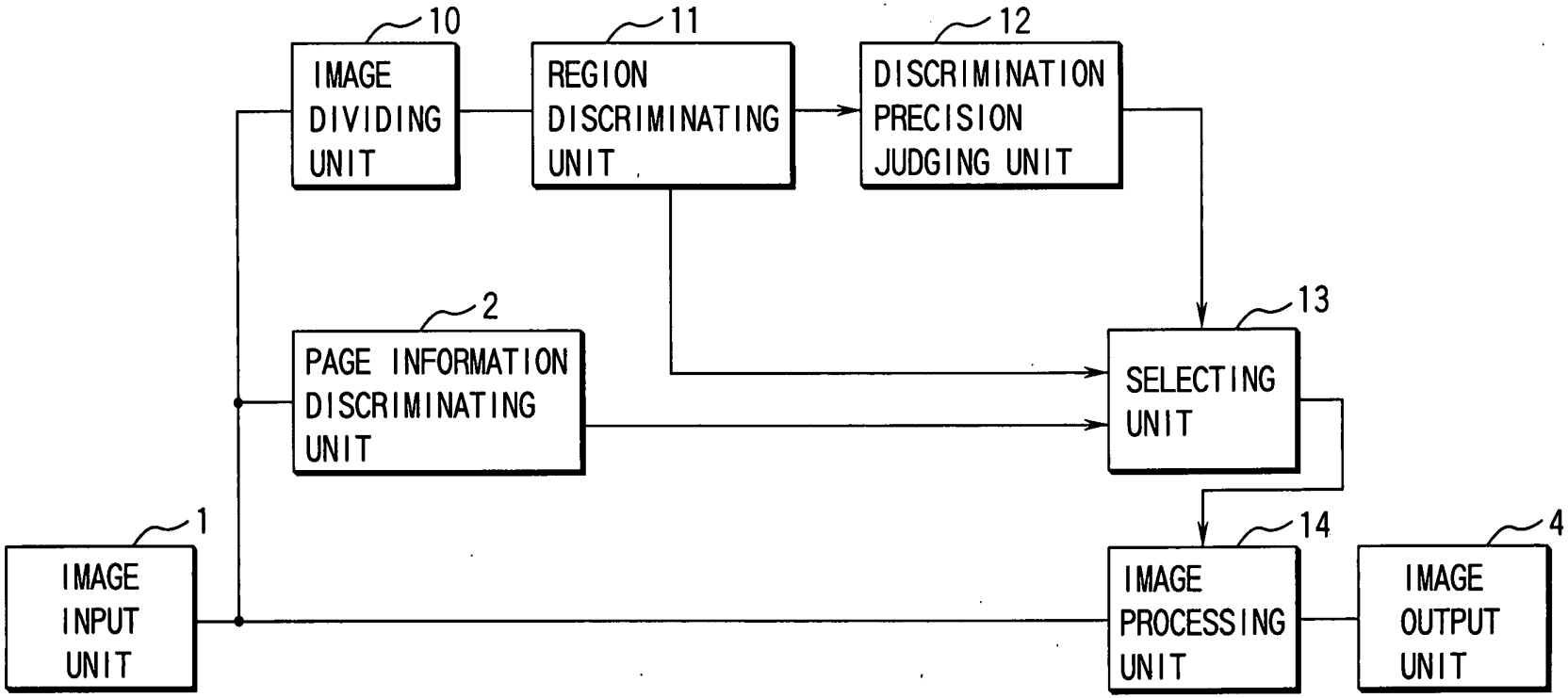

FIG. 33

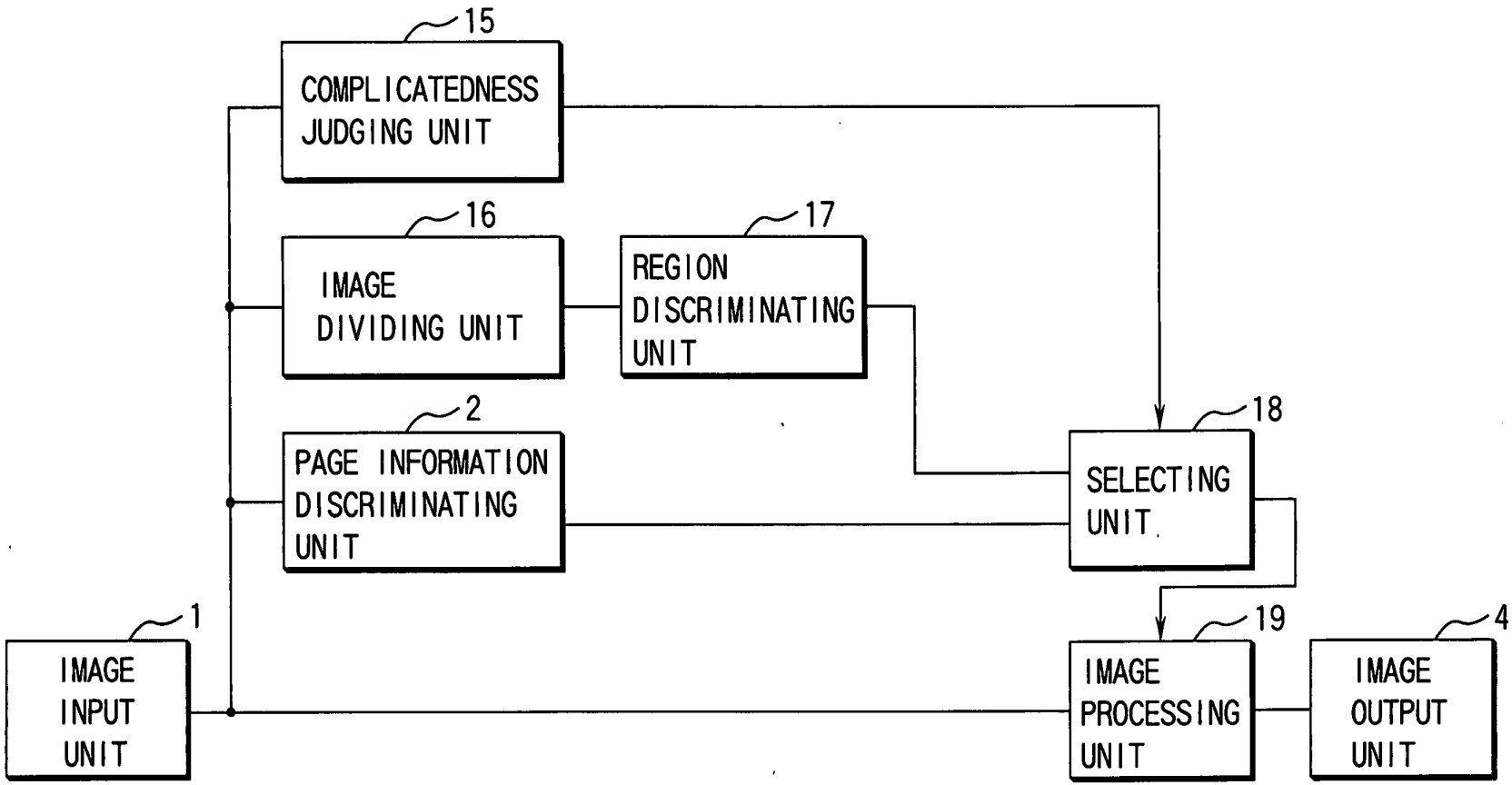
15
COMPLICATEDNESS JUDGING UNIT
16
IMAGE DIVIDING UNIT
17
REGION DISCRIMINATING UNIT
2
PAGE INFORMATION DISCRIMINATING UNIT
18
SELECTING UNIT
1
IMAGE INPUT UNIT
19
IMAGE PROCESSING UNIT
4
IMAGE OUTPUT UNIT

FIG. 34

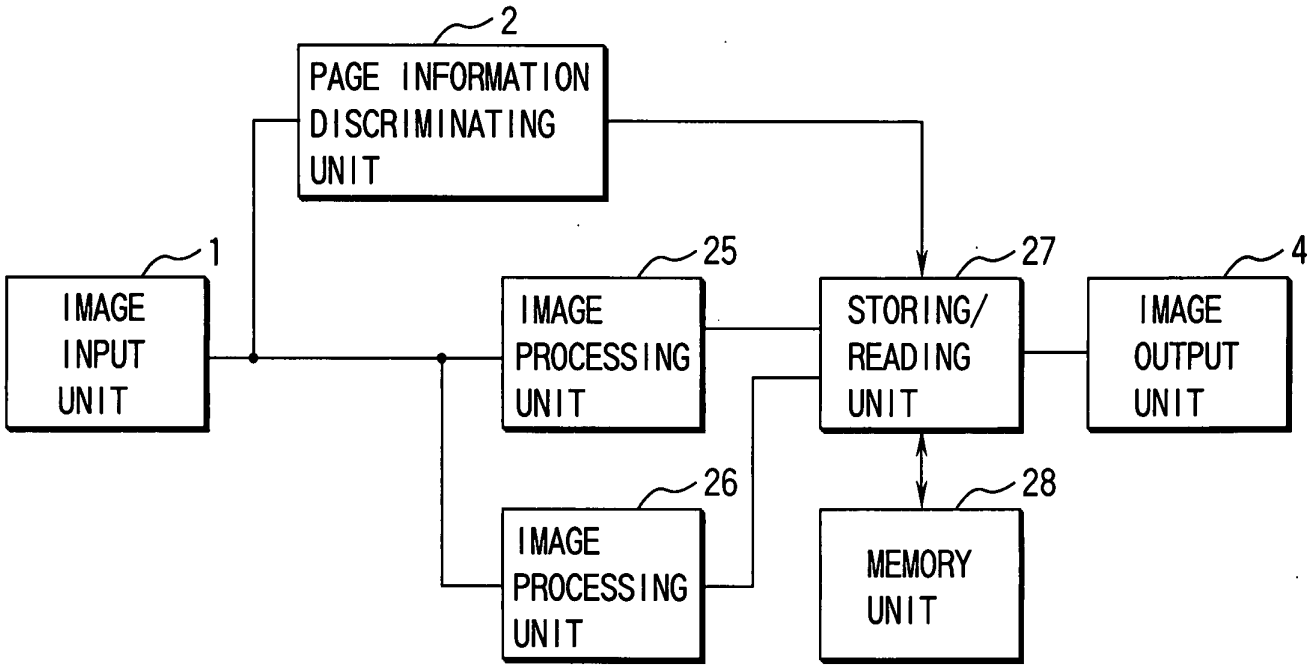
2
PAGE INFORMATION DISCRIMINATING UNIT
1
IMAGE INPUT UNIT
25
IMAGE PROCESSING UNIT
27
STORING/ READING UNIT
4
IMAGE OUTPUT UNIT
26
IMAGE PROCESSING UNIT
28
MEMORY UNIT

FIG. 35

PAGE DISCRIMINATION RESULT		PAGE DISCRIMINATION CODE	REGION DISCRIMINATION CODE	COLOR CONVERSION	BACKGROUND PROCESSING	PIXEL DISCRIMINATION	FILTER	BLACK COLOR/ BLACK CHARACTER	GRADATION PROCESSING
REGION DISCRIMINATION	UNIFORM BACKGROUND	0	0	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO A	CHARACTER/ PHOTO A	CHARACTER/ PHOTO	CHARACTER/ PHOTO
	DOT BACKGROUND		1			CHARACTER/ PHOTO B	CHARACTER/ PHOTO B		
	DOT PHOTO		2			–	CHARACTER/ PHOTO C		
	CONTINUOUS PHOTO		3			–	CHARACTER/ PHOTO D		
PAGE DISCRIMINATION	UNIFORM BACKGROUND	1	–	CHARACTER	CHARACTER	CHARACTER/ PHOTO A	CHARACTER/ PHOTO A	CHARACTER	CHARACTER
	DOT BACKGROUND	2	–	MAP	MAP	CHARACTER/ PHOTO B	CHARACTER/ PHOTO B	MAP	MAP
	DOT PHOTO	3	–	PRINTED PHOTO	PRINTED PHOTO	–	PRINTED/ PHOTO	PRINTED PHOTO	PRINTED PHOTO
	CONTINUOUS PHOTO	4	–	PHOTOGRAPHIC PRINTING PAPER PHOTO	PHOTOGRAPHIC PRINTING PAPER PHOTO	–	PHOTOGRAPHIC PRINTING PAPER PHOTO	PHOTOGRAPHIC PRINTING PAPER PHOTO	PHOTOGRAPHIC PRINTING PAPER PHOTO
	INDISCRIMINATIVE	5	–	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO
OTHERS	TIME OUT	6	–	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO	CHARACTER/ PHOTO

FIG. 36